

REMARKS:

Claims 1 and 3-12 are in the case and presented for reconsideration.

Claims 1 and 6 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,760,432 to Abe et al. In particular, the Office states that Abe '432 discloses $\text{Ba}_{0.44}\text{Sr}_{0.56}\text{TiO}_3$ and $(\text{Ba}_{0.44}\text{Sr}_{0.56})\text{TiO}_3$.

Applicants have rewritten claim 1, which now recites $\text{Ba}_{1-x}\text{Sr}_x\text{TiO}_3$ ($1 > x > 0.76$ and $0.10 > x > 0$). Therefore, $\text{Ba}_{0.44}\text{Sr}_{0.56}\text{TiO}_3$ and $(\text{Ba}_{0.44}\text{Sr}_{0.56})\text{TiO}_3$ are not recited in claim 1. Since Abe '432 does not teach or suggest any of the other members of the Markush group of claim 1, claim 1 is not anticipated by Abe '432.

Claim 6 depends from claim 1 and is therefore patentable for at least the same reasons as claim 1.

Claims 1 and 6 were rejected under 35 U.S.C. 102(b) as being anticipated by Konushi et al. (JP 10-335179). As part of the basis for its rejection, the Office states that Konushi et al. discloses $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ as a ferroelectric ceramic material.

Applicants have rewritten claim 1, which now recites $(\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3)_x - (\text{PbTiO}_3)_{1-x}$ ($0 \leq x < 1$). Thus, claim 1 does not recite $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ as a ferroelectric ceramic material.

The Office further states that Konushi et al. discloses that the material is formed from a PZT. Applicants reiterate that claim 1 recites $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ ($0 \leq x \leq 1$) doped with Nb. Konushi et al. fails to teach or suggest $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ ($0 \leq x \leq 1$) doped with Nb. However, in lieu of the Office's rejection of claim 1 based on U.S. Patent 5,005,102 to Larson in view of U.S. Patent 5,431,958 to Desu et al., applicants have rewritten claim 1 to exclude $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ ($0 \leq x \leq 1$) doped with Nb from the ferroelectric ceramic material Markush group. Applicants have addressed this rejection in more detail below.

Next, the Office has indicated that Konushi et al. discloses that the material is formed from a PLZT. Claim 1 has been rewritten to recite $\text{Pb}_{1-1.5y}\text{La}_y(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ ($x=1$ or $x=0$, $0 \leq y \leq 0.2$). Thus, PLZT is not a member of the ferroelectric ceramic material Markush group since $(\text{Zr}_x\text{Ti}_{1-x})$ can only be one of either Zr or Ti, when $x=1$ or $x=0$.

As a result, claim 1 is not anticipated by Konushi et al. Claim 6 depends from claim 1 and is therefore patentable for at least the same reasons as claim 1.

Claims 1 and 3-6 were rejected under 35 U.S.C. 103(a) as being obvious from U.S. Patent 5,005,102 to Larson in view of U.S. Patent 5,431,958 to Desu et al. As part of the basis for rejection, the Office states that Desu et al. teaches the use of $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ ($0 \leq x \leq 1$) doped with Nb.

Applicants have rewritten claim 1 to exclude $\text{Pb}(\text{Zr}_x\text{Ti}_{1-x})\text{O}_3$ ($0 \leq x \leq 1$) doped with Nb from the ferroelectric ceramic material Markush group. Therefore, claim 1 is not obvious from the cited references.

Claims 3-6 depend from claim 1 and are therefore patentable for at least the same reasons as claim 1.

Claims 1, 6, and 8 were rejected under 35 U.S.C. 103(a) as being obvious from U.S. Patent 5,159,524 to Hasegawa et al. in view of U.S. Patent 5,005,102 to Larson. Notably, the Office states that Hasegawa et al. discloses barium titanate as a ferroelectric ceramic material.

Claim 1 has been rewritten and now only recites BaTiO_3 with dopants. None of the cited references teach or suggest BaTiO_3 with dopants as a ferroelectric ceramic material. Furthermore, claim 1 has been rewritten to recite $\text{BaZr}_x\text{Ti}_{1-x}\text{O}_3$ ($0 < x \leq 1$), $(\text{Ba}_{1-x}\text{Ca}_x)\text{TiO}_3$ ($0 < x \leq 1$), $(\text{Ba}_{1-x}\text{Pb}_x)\text{TiO}_3$ ($0 < x \leq 1$), $(\text{Ba}_{1-x}\text{Sr}_x)(\text{Ti}_{1-x}\text{Zr}_x)\text{O}_3$ ($0 < x \leq 1$, $0 \leq y \leq 1$) so that BaTiO_3 is excluded from the ferroelectric ceramic material Markush group.

Claims 6 and 8 depend from claim 1, and are therefore patentable for at least the same reasons as claim 1.

Claims 3-5 and 8 were rejected under 35 U.S.C. 103(a) as being obvious from Abe '432 in view of U.S. Patent 6,104,597 to Konushi. Claims 3-5 and 8 depend from claim 1 and are therefore patentable for at least the same reasons as claim 1, which are explained in more detail above.

Claim 7 was rejected under 35 U.S.C. 103(a) as being unpatentable over Abe '432 in view of Klee '027. Claim 7 depends from claim 1 and is therefore patentable for at least the same reasons as claim 1, which are explained above.

Claim 9 was rejected under 35 U.S.C. 103(a) as being obvious from Hasegawa '524 in view of Larson '102 and U.S. Patent 4,156,211 to Buswell et al.

Claim 9 has been rewritten and now recites the same Markush group that is recited in claim 1. Therefore, barium titanate is excluded from the Markush group of claim 9. Hasegawa '524 does not teach or suggest any of the recited elements of the Markush group of claim 9. Accordingly, claim 9 is believed to be patentable.

Claim 10 was rejected under 35 U.S.C. 103(a) as being obvious from Hasegawa '524 in view of Larson '102 and U.S. Patent 4,468,644 to Teague et al.

Claim 10 has been rewritten and now recites the same Markush group that is recited in claim 1. Therefore, barium titanate is excluded from the Markush group of claim 10. Hasegawa '524 does not teach or suggest any of the recited elements of the Markush group of claim 10. Accordingly, claim 10 is believed to be patentable.

Claim 11 was rejected under 35 U.S.C. 103(a) as being obvious from Hasegawa '524 in view of Larson '102 and U.S. Patent 5,801,601 to Gayle.

Claim 11 has been rewritten and now recites the same Markush group that is recited

in claim 1. Therefore, barium titanate is excluded from the Markush group of claim 11. Hasegawa '524 does not teach or suggest any of the recited elements of the Markush group. Accordingly, claim 11 is believed to be patentable.

Claim 12 was rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa '524 in view of Larson '102 and U.S. Patent 5,923,233 to Jantunen et al.

Claim 12 has been rewritten and now recites the same Markush group that is recited in claim 1. Therefore, barium titanate is excluded from the Markush group of claim 12. Hasegawa '524 does not teach or suggest any of the recited elements of the Markush group. Accordingly, claim 12 is believed to be patentable.

Claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over Konushi et al. (JP 10-335179) in view of U.S. Patent 4,156,211 to Buswell et al.

Claim 9 has been rewritten and now recites the same Markush group that is recited in claim 1. Therefore, $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$, PZT, and PLZT are excluded from the Markush group of claim 9. Konushi et al. fails to teach or suggest any of the recited elements of the Markush group. Accordingly, claim 9 is believed to be patentable.

Claim 10 was rejected under 35 U.S.C. 103(a) as being unpatentable over Konushi et al. (JP 10-335179) in view of U.S. Patent 4,468,644 to Teague et al.

Claim 10 has been rewritten and now recites the same Markush group that is recited in claim 1. Therefore, $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$, PZT, and PLZT are excluded from the Markush group of claim 10. Konushi et al. fails to teach or suggest any of the recited elements of the Markush group. Accordingly, claim 10 is believed to be patentable.

Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Konushi et al. (JP 10-335179) in view of U.S. Patent 5,801,601 to Gayle.

Claim 11 has been rewritten and now recites the same Markush group that is recited

in claim 1. Therefore, $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$, PZT, and PLZT are excluded from the Markush group of claim 11. Konushi et al. fails to teach or suggest any of the recited elements of the Markush group. Accordingly, claim 11 is believed to be patentable.

Claim 12 was rejected under 35 U.S.C. 103(a) as being unpatentable over Konushi et al. (JP 10-335179) in view of U.S. Patent 5,923,233 to Jantunen et al.


Claim 12 has been rewritten and now recites the same Markush group that is recited in claim 1. Therefore, $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$, PZT, and PLZT are excluded from the Markush group of claim 12. Konushi et al. fails to teach or suggest any of the recited elements of the Markush group. Accordingly, claim 12 is believed to be patentable.

Accordingly, the application and claims are believed to be in condition for allowance, and favorable action is respectfully requested. No new matter has been added.

If any issues remain which may be resolved by telephonic communication, the examiner is respectfully invited to contact the undersigned at the number below, if such will advance the application to allowance.

Favorable action is respectfully requested.

Respectfully submitted,


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